SIMCO
An Illinois Tool Works Company

INSTRUCTIONS
Operation / Maintenance

ORION / SIDEKICK
Ionizing Air Nozzle systems

2257 North Penn Road
Hatfield, PA 19440
Phone: (215) 822-2171
Fax: (215) 997-3450

(Manufactured by SIMCO
USA and international patents pending)

Publication 5200833
Rev C, March 2003

Introduction
SIMCO's ORION and SIDEKICK Ionizing Air Nozzle Systems combine air ionization with a forceful compressed gas stream for "hands free" fixed position operation. Each system is ideally suited for use with automated manufacturing processes and product assembly.
The ORION and SIDEKICK provide the ability to clean and neutralize electrostatically charged items and greatly reduce the re-attraction of particulate. The neutralization of charges is imperative for static sensitive components easily damaged by electrical overstress or electrostatic discharge (EOS/ESD). A filter at the exit of the nozzle ensures delivery of contaminate free gas during the cleaning and static neutralizing operation.

SECTION 1 Description of Operation
SECTION 2 Features
SECTION 3 Specifications
SECTION 4 Safety
SECTION 5 Installation
SECTION 6 System Operation
SECTION 7 Maintenance
SECTION 8 Replacement Parts
SECTION 9 Warranty

SECTION 1 Description of Operation

The ORION and SIDEKICK ionizing air nozzle systems produce an intense gas stream rich in both positive and negative air ions. Directing the gas stream onto an item that has an electrostatic charge will neutralize the charge and clean the item. It is ideal for cleaning items that have developed a static charge due to handling or in the fabricating process. If the item has a negative static charge, it will attract positive ions from the gas stream. If the item has a positive static charge, it will attract negative ions from the gas stream. The air ions are drawn onto the oppositely charged item surfaces, thereby neutralizing the static.

The power unit may be supplied with compressed clean dry air, nitrogen, or carbon dioxide at pressures up to 100 PSI. A gas input port located on the power unit connects with a built-in solenoid valve to regulate on and off flow. High quality polyurethane tubing conducts the gas from the power unit to the nozzle. All gas is made contaminate free prior to exiting the nozzle with an integrated, disposable filter. The nozzle has been specially designed to yield a forceful jet of gas while operating at the lowest possible noise levels.

The ORION and SIDEKICK power unit utilizes a safety approved low current, high voltage transformer to energize the ion emitter positioned near the filter-nozzle. From this emitter the surrounding air is ionized and entrained into the gas stream exiting from the nozzle. Ion balance is sensed through a special ring surrounding the emitter on the front of the nozzle housing. Ion balance is then electronically communicated back to the power unit. Adjustment of ion balance may be accomplished directly at the nozzle, as well as at the power unit.

A keyed circular socket in the power unit provides the remote control hook-up for activation of nozzle gasflow and ionization. A mating plug is provided for this connection.
The SIDEKICK model includes a footswitch assembly for activation at floor level.

SECTION 2 Features

- Compact nozzle and cable assembly for close quarters applications
- Intense nozzle gas jet with ionization for static free blow off cleaning
- Integrated filter within nozzle for contaminate free gas discharge
- Remote control activation of power unit and nozzle
- Convenient ionization balance adjustments at nozzle and power unit

SECTION 3 Specifications

ORION Part Number:	4009045	4009046	4009220
SIDEKICK Part Number:	4009245 (N.AM/Japan)	4009246 (Cont. Euro.)	4009449 (UK, IRELAND)
Cable Length:	7' (2.13 m)	7' (2.13 m)	7' (2.13 m)
Line Voltage:	120 VAC	230 VAC	240 VAC
Frequency:	50/60 Hz	50/60 Hz	50/60 Hz
Current draw (idle):	0.01 Amps	0.005 Amps	0.005 Amps
Current draw (operation):	0.10 Amps	0.05 Amps	0.05 Amps
Power Inlet:	IEC320, class 1		
Remote control connector:	4 position, keyed circular		
Gas Inlet:	1/4 NPT (female)		
Input Pressure:	100 PSI (7 bar) maximum, clean dry air, nitrogen, or CO2.		
Gas Consumption:	2.4 SCFM at 30 PSI 4.6 SCFM at 60 PSI 7.4 SCFM at 100 PSI	(68 l/min. at 2 bar) (130 l/min. at 4 bar) (210 l/min. at 7 bar)	
Output Pressure:	Pressure relief in nozzle complies with OSHA requirements.		
Replaceable Filter:	0.01 micron rating		
Noise Level:	76 dB at 30 PSI (2 bar) 89 dB at 60 PSI (4 bar) 97 dB at 100 PSI (7 bar) Measured 24" (600 mm) from nozzle.		
Ozone Production:	0.001 PPM Measured 18" (450 mm) from nozzle operating at 15 PSI (1 bar). Test conducted in accordance with EPA EQOA-0577-019 using Dasibi Ozone Monitor model 1003AH.		
Operating Temperature:	32°F (0°C) to 104°F (40°C)		
Construction:	Nozzle: Polycarbonate / ABS alloy, static dissapative Cable: Polyurethane, static dissapative Power Unit: Steel with polyester coating		

SECTION 3 Specifications (continued)

Weight:	Nozzle: 6.5 ounces (185 g) Cable: 1.25 ounces / foot (115 g / m) Power Unit: 6.0 pounds (2.7 kg)
Power Unit Size: (not including flanges)	6.45" H x 5.20" W x 3.35" D (164 mm H x 132 mm W x 85 mm D)
Ion Balance (offset voltage):	0V +/-15V
Ion Output (discharge time):	Less than 2 seconds at 6 inches distance. Less than 1 second at 2 inches distance.
Product Safety Approvals:	UL/CUL LISTED, CE compliant.

Offset voltage and discharge time determined as per ESD Association STM S3.1 using a charged plate monitor (6"x 6", 20 pF plate). Discharge times in seconds; 1000 to 100 volts.

SECTION 4 Safety

Please read this instruction manual carefully before installing, operating, or servicing the system. Qualified service personnel must perform installation and maintenance.

WARNING: Always wear safety glasses when in proximity of operating nozzle.
Do not operate system in excess of gas input and voltage specifications.
Do not operate system in flammable or explosive atmospheres.
Do not operate system in wet environment.
Do not clean filter/nozzle with alcohol or glycol.
Should nozzle, cable, or power unit show signs of excessive wear or damage, remove system from service and refer to qualified service personnel or contact SIMCO for instructions.

SECTION 5 System Installation

5.1 Mounting the Power Unit

The power unit may be mounted onto any convenient rigid surface such as a wall, machine frame, or workbench using the built-in mounting flanges. The rear flanges have a mounting hole pattern that will match a variety of pre-punched holes often found on work bench legs or perforated angle stock. When mounted with power and air connections positioned downward, the power unit case may be used as a hanger for excess cable.
(Mounting hardware is not provided)

5.2 Gas and Line Voltage Connections to the Power Unit

Compressed air, nitrogen or carbon dioxide is supplied to the power unit through a supplied 1/4" NPT female connector. The connector contains a screen to stop large debris from entering the unit. Do not remove this connector. Support the connector with a wrench while installing the user supplied compressed air fitting. Connect the compressed gas using appropriate tubing and fittings. The flow diameter of the tubing and fittings should not be less then 3/16" (4 mm). (If tubing or fittings with inadequate flow diameter are used, performance may be greatly reduced.) The compressed gas should be clean, dry and oil free. The maximum allowable input pressure is 100 PSI (7 bar). (The use of an external pressure regulator and filter / dryer is recommended).

Line voltage is supplied to the power unit through a standard IEC320, class 1 socket. Plug the supplied line cord into power unit and into a grounded outlet. Refer to serial label on the side of the power unit for the line voltage requirements. This unit must be electrically grounded for proper operation and safety. (Do not defeat line cord ground plug.)

5.3 Mounting the Nozzle

Route and secure the ORION nozzle or SIDEKICK nozzle cable, free from pinching or kinking.
The ORION nozzle may be mounted onto any flat surface of a machine frame or fixture, etc. Position the nozzle at the desired location, typically 2” to 12” away from the object to be neutralized and cleaned. Secure through the attached metal bracket with a combination of #8-32, or equal size, screw/ washer/ nut hardware. (Mounting hardware is not provided)
The SIDEKICK nozzle may be mounted onto any flat surface of a benchtop or wall, etc. Position the nozzle at the desired location, typically 2” to 12” away from the object to be neutralized and cleaned. Secure through the attached metal “U” base with a combination of #8-32, or equal size, screw/ washer/ nut hardware. (Mounting hardware is not provided)

Caution:
The nozzle and cable must be protected from impact with moving machine components.

5.4 Remote Control Hook-up

WARNING: ELECTRICAL SHOCK HAZARD
Remote control circuit is electrically live (115 volts DC) when the power unit is activated.

The power unit is equipped for remote activation of nozzle gasflow and ionization.
A user supplied switch or relay, and wiring with the following minimum electrical rating is required for this feature. Qualified service personnel must perform the wiring connections.
Disconnect the line cord from power unit before starting remote control hook-up.
Remote control electrical rating: 115VDC (open circuit), 0.005 Amp (closed circuit)
A keyed circular connector is built into the utility panel of the power unit for this hook-up.
The power unit will activate upon closure between connector pin positions #2 and #3.
Position #2= Remote control circuit positive.
Position #3= Remote control circuit common.
Position #1= Optional protective grounding for remote control device via the power unit.
A mating plug with cap kit is supplied to complete this connection. The maximum recommended wire/cable diameter to fit through the plug and cap is 0.315”(8mm).

Wire connections to the plug will require stripping and soldering.
The footswitch assembly provided with the SIDEKICK model is prewired per the above requirements and may be simply plugged into the power unit connector.

SECTION 6 System Operation

The system is ready for operation when the power unit has been properly connected to the gas and electrical supplies, remote control wiring completed, and the nozzle is mounted.
A small red light located on the side of the nozzle will glow when the system has been connected to electrical supply. Open the main gas valve/regulator to supply the recommended pressure to the power unit.
Remotely switch “on” the power unit to activate the gas flow and ionization from the nozzle.

IMPORTANT: OPERATION SAFETY NOTICE

The ORION/ SIDEKICK nozzle complies with the Occupational Safety and Health Act (OSHA), 29 CFR ch. XVII, Part 1910.242B, entitled "Compressed air used for cleaning". This part reads "Compressed air shall not be used for cleaning purposes except where reduced to less then 30 PSI and then only with effective chip guarding and personal protective equipment". The nozzle complies with the applicable air pressure limits through built-in pressure relief slots at the gas outlet. Users must provide effective chip guarding and personnel protective equipment.

Occupational Safety and Health Act (OSHA), 29 CFR ch. XVII, Part 1910.95, entitled "Occupational noise exposure" specifies a maximum permissible noise exposure of 3 hours per day at 97 dB. At maximum gas pressure the nozzle produces a noise level of approximately 97 dB. Users must wear hearing protectors when exposed to a nozzle operating at maximum pressure in excess of 3 hours per day.

SECTION 7 Maintenance

7.1 Ion Emitter Inspection and Cleaning

The ion emitter in the nozzle will require periodic removal of debris buildup resulting from normal use.
A quarter yearly emitter cleaning is recommended for optimum ion emitter performance. More frequent cleaning may be necessary under extremely dusty operating conditions.
The ion emitter point is located in the center of the cylinder positioned alongside the nozzle gas outlet.
Disconnect the electrical line cord and shut off the gas supply to the power unit. Moisten a cotton or plastic foam swab with isopropyl alcohol and carefully rotate it around the ion emitter point. Be sure not to leave any fibers on the point if a cotton swab is used. The cleaned point should be bright and sharp. Allow the ion emitter point to dry completely before reconnecting the line cord and gas supply to the power unit.

7.2 Gas Filter Replacement

A slot on the side of the nozzle housing allows for viewing of the gas filter and its condition. The gas filter includes a sensing medium that colors red as moisture and contaminates are captured. When the red color advances to the midpoint of the window or gasflow is noticeably reduced, replacement of the filter is recommended.
Disconnect the line cord and shut off the gas supply to the power unit.
A narrow flat bladed screwdriver (blade width: approximately 3/16"(5 mm) is required to release the filter.
Insert the screwdriver into the viewing slot between the gas filter and the lock collar. Twist the screwdriver fully to depress the lock collar ring. Simultaneously pull on the front of the gas filter to remove it from the housing.
If the filter does easily release, rotate the front of the filter a half turn and repeat the above procedure until removed.
Install a new gas filter by pushing it fully into the filter socket until it stops.

7.3 Ion Balance and Ion Output Test

Ion balance (offset voltage) and ion output (discharge time) are measured using a charged plate monitor. (such as the SIMCO Electrostatic Analyzer.)
The standard for this test procedure is ESD Association STM 3.1 (ESD Association, 20 Liberty Plaza, Rome, NY 13440-5811). The typical testing interval is every 12 months. Inspect the gas filter and clean the ion emitter point before testing.

Ion Balance
Position the nozzle 6" (15 cm) from center of sensing plate on the charged plate monitor. Set-up the charged plate monitor to measure ion balance according to the manufacturer's instructions. Activate the power unit remote feature and adjust gas input pressure to 50 PSI (3.5 bar).
The ion balance point (potentiometer) is located is located at the side of the nozzle. (The initial factory adjustment is covered with a seal.) Readjustment may be made with a standard trim pot tool or insulated screwdriver. Allow ion balance reading to stabilize before making any adjustments. A zero ion balance is ideal. If ion balance can not be adjusted to zero, the ion balance “offset” may need adjustment.

Ion Balance Offset
Center ion balance potentiometer on the nozzle. Activate the power unit remote feature. The ion balance offset (potentiometer) is accessed through a hole on the side of the power unit. Adjustment may be made with a standard trim pot tool or insulated screwdriver. Adjust the ion balance offset potentiometer for an ion balance as close to zero as possible. It may be necessary to readjust the ion balance potentiometer on the nozzle to achieve the ideal zero balance.

Ion Output
Position the nozzle 6" (15 cm) from center of sensing plate on charged plate monitor. Set-up charged plate monitor to measure discharge time according to the manufacturer's instructions. Activate the power unit remote feature and adjust gas input pressure to 50 PSI. Perform positive and negative discharge time tests (1000 to 100 volts) and average the results. Check results against data in Section 3, “Specifications”.

If a charged plate monitor is not available, use a hand-held fieldmeter (such as the SIMCO Hand-E-Stat) to check ion output using the following procedure:

1. Rub a small piece of plastic with a section of cloth until an electrostatic charge can be detected by the fieldmeter.
2. Activate the power unit remote feature and adjust gas input pressure to 50 PSI (3.5 bar).
3. Blow gas from the nozzle onto the plastic at 6" (15 cm) for 2 seconds.
4. Remove the plastic from the ionized gas stream and again measure for electrostatic charge with the fieldmeter. Little if any static charge should be detected on the piece of plastic.

If no instrumentation is available, ion output may be verified with the following procedure:

1. Dispense a 10" length of plastic mending tape. Approach the non-adhesive side of the tape with your free hand and note the electrostatic attraction between your hand and the tape.
2. Activate the power unit remote feature and shut off gas flow completely.
3. Pass the non-adhesive side of the tape approximately 1" (25 mm) in front of the nozzle.
4. Approach the non-adhesive side of the tape with your free hand. The electrostatic charge on the tape should be neutralized and the attraction eliminated.

SECTION 8 Replacement Parts

Part Number	Description
5050696	Filter/nozzle Kit (includes 2 units)
4107956	Air Inlet Filter Fitting
4107765	Blow-off Nozzle with 7' (2.4m) Cable
4630185	High Voltage Transformer, 120 VAC
4630186	High Voltage Transformer, 230 VAC
4106199	Power Unit Circuit Board, 120 VAC
4106234	Power Unit Circuit Board, 230 VAC
4630144	Solenoid Valve, 120 VAC
4630151	Solenoid Valve, 230 VAC
4107399	Footswitch Assembly

SECTION 9 Warranty

SIMCO Ionization for Electronics Manufacture warrants its products to be free of defects in components, workmanship, or materials for a period of one year from the date of purchase. This warranty does not apply to any physical or electrical damage done to the product through misuse or abuse or negligence (such as any modifications made to the unit or service work done by any other than SIMCO authorized technicians). Any unit that has had its serial number altered or removed will be ineligible for warranty.

All products returned must have an “RA” (Return Authorization) number regardless of warranty status. Call SIMCO for an assigned RA number.

SIMCO will not be liable for loss or damage due directly or indirectly to an occurrence or use for which the product is not designed or intended. In no event shall SIMCO be liable for incidental or consequential damages except where state laws override.

This warranty extends to the original purchaser and is not transferable. No person, agent, distributor, dealer or company is authorized to change, modify, or amend the terms of this warranty in any manner whatsoever.

SIMCO
Ionization for Electronics Manufacture
2257 North Penn Road
Hatfield, PA 19440
Phone: (215) 822-2171
(800) 538-0750
Fax: (215) 997-3450
Web: http://www.simco.biz